Several cultures of the nematode have been grown on artificial media for five and one half months, transfers being made every ten days to two weeks. At the end of six months the worms failed to reproduce and the majority died.

During the cultivation of these strains, the nematodes were repeatedly shown to be capable of producing fatal infection in beetle larvae. A culture after six months on media, and which had seemingly lost its ability to grow, was still capable of infecting beetle larvae. The forms obtained from these again produced good cultures.

It is believed that this is the first time that the entire life cycle of a parasitic nematode has been obtained on an artificial medium. The cultivation of this form enables us to obtain worms in large numbers, and may give us a method for the control of Japanese beetle infestation. This possibility is now being investigated in cooperation with the New Jersey State Department of Agriculture.

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THE POTATO RUGOSE MOSAIC COMPLEX

IN recent years the identity of the virus or viruses causing rugose mosaic of potato has been questioned. Although it has often been suspected and even claimed that this disease is not due to a single virus, this fact has not been definitely demonstrated or clearly explained.

Working in Johnson's laboratory at the University of Wisconsin and using his viruses, the writer has found that the rugose mosaic disease of potato, which is identical with "spot-necrosis" of tobacco, is caused by a combination of two distinct viruses. The "mottle" virus, which is normally present in apparently healthy potatoes of most if not all standard American varieties, is one of the viruses in the combination causing this disease. This virus is readily transmitted by plant extract but not by aphids. The other virus in this complex is readily transmitted by aphids as well as by plant extract. The symptoms of the aphid-transmitted virus on young Havana tobacco plants are often faint; usually only a clearing of the veins and a general flattening of the plant are apparent.

The aphid-transmitted virus may be separated from the rugose mosaic or "spot-necrosis" complex by means of the aphids *Myzus persicae* or *Macrosiphum solanifolii*. The "mottle" virus may be separated from the complex by various means but may also be readily obtained, free of the aphid-transmitted virus, from apparently healthy potatoes. When these two viruses are combined the result is typical "spot-necrosis" on tobacco or rugose mosaic on potato.[1] When only the insect-transmitted virus is inoculated to the American Bliss Triumph potato, for instance, the result is typical rugose mosaic, since the "mottle" virus is already present. On the other hand, if this virus is transmitted to tobacco it will not produce "spot-necrosis," unless the "mottle" virus is artificially introduced. If the "mottle" virus is not present, as is apparently the case in certain foreign varieties of potato, aphid transmission will naturally fail to produce the typical rugose mosaic disease, although artificial inoculation will succeed. This may explain the contradictory results secured with different varieties of potatoes in foreign countries.

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MICHELSON AND ROWLAND

DR. MILLIKAN'S excellent obituary of Michelson, published in SCIENCE May 22, contains one statement to which exception may be taken, for it seems to do injustice to another man. This statement is that Michelson in 1880 "became the best known American physicist by virtue of his new speed-of-light measurement."

In the decade ending with 1880 Rowland had published his research on the relation between magnetic induction and magneto-motive force in ferromagnetic metals, had during a short stay in Berlin proved experimentally the magnetic effect of electric convection, an achievement which Helmholtz had attempted in vain, had improved upon the British Association determination of the ohm, and had remeasured the mechanical equivalent of heat, thus displacing the value found by Joule. In the year 1880, I believe, and certainly not later than 1881, he had begun the construction of that dividing engine which was soon to make the Rowland concave diffraction gratings universally and permanently famous. These gratings and the measurements he made with them won for him the Draper Medal of the National Academy of Sciences in 1890, many years before the same award was made to Michelson.

EDWIN H. HALL

CAMBRIDGE, MAY 25, 1931

CONSULTANT SERVICE AT THE LIBRARY OF CONGRESS

THE letter published in SCIENCE of January 2 in regard to the new consultant service at the Library of Congress has elicited correspondence, some of which indicates the need of further information as to certain details of the service offered by the library.

[1] After submitting this manuscript for publication, the writer received Kentucky Agricultural Experiment Station *Res. Bull.* No. 309, in which Valleau and Johnson report having reached similar conclusions.